



# Sustainable Power Solutions for Mines, Industries and Islands

Abengoa is an expert in the **hybridization of power plants to provide dispatchable, clean energy solutions**, and its capabilities to supply **affordable and reliable decarbonization solutions** for mines, industrial facilities and isolated grids are globally recognized, with more than 13 GW of power plants – both renewable and conventional – successfully installed and under construction.

Its scope of activity includes technical development support, engineering services, Engineering, Procurement and Construction (EPC), consultancy, or Operation and Maintenance (O&M) services, integrating a wide range of technologies and providing all the necessary guarantees.

## Hybridization

Abengoa has been **the first company to hybridize solar with gas** on a utility-scale project and has **the world's largest reference plant completed** (470 MW) in Morocco. With its **own solar thermal technology**, Abengoa is a **world leader** in the construction of these type of plants, with a total capacity of 1.9 GW, representing approximately 30% of capacity worldwide.

It has installed the **world's largest portfolio** of thermal energy storage facilities, using molten salts for long-duration reliable discharge, and has experience in lithium-ion batteries to manage short term variability.

One of its most important reference of hybridization is the Cerro Dominador solar power platform (Chile), property of EIG Global Energy Partners, where Abengoa is currently constructing a 110 MW solar thermal plant and has already completed a solar photovoltaic plant of 100 MW. This platform has thermal energy storage system and batteries that will allow to produce 210 MW with 17 hours of storage – the world's first truly dispatchable utility-scale renewable energy complex.

Here, the dispatchability of solar thermal energy (Concentrated Solar Power) with thermal energy storage, solar photovoltaic power and the fast response of battery energy storage systems converge into a single installation to provide an affordable, 24/7 clean energy solution

The first company to hybridize solar with gas

## Decarbonization commitment

Abengoa's experience across technologies – **solar, wind, batteries, engines, biomass, cogeneration, water** – has now progressed to next generation **Decarbonization technologies** such as **Hydrogen Fuel Cells** and **Green Hydrogen** produced from Renewables. It has also developed its own proprietary **Industrial Solar Process Heat** technology for high temperature heavy industrial processes, adapted to the needs of strategic sectors requiring reliable decarbonization technologies.

Abengoa's focus on sustainability on the energy and water nexus allows it to partner with companies looking to modernize and decarbonize their processes with affordable and bankable solutions.

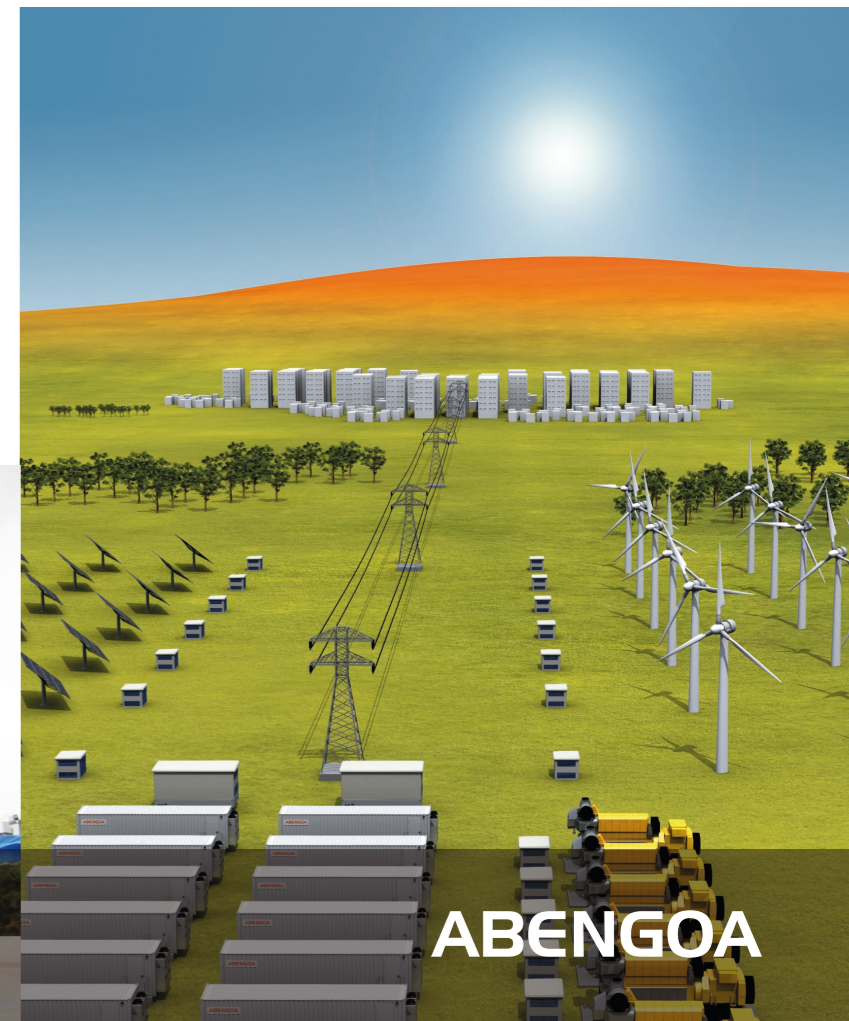
As part of its commitment with the sustainable development, Abengoa has a Greenhouse Gases Inventory (GHG) since 2008, based on international standards such as Intergovernmental Panel on Climate Change (IPCC) methodologies and GHG Protocol Corporate Accounting and Reporting Standard that covers every part of its emissions sources, both direct and indirect, including the main sources of its supply chain.

Proprietary Industrial Solar Process Heat technology

**Abengoa** is an international company that applies innovative technology solutions for sustainability in the **infrastructure, energy and water** sectors. It has over 75 years of experience in **engineering and construction**, being specialists in the execution of complex "turnkey" projects or engineering, supply and construction projects **(Engineering, Procurement and Construction)** for third parties in four fundamental areas: **energy, water, services and transmission and infrastructure**.

Thanks to the proprietary modelling and optimization tools, Abengoa Energy Management System (AEMS), allows the company to define the optimal solution based on its experience across this broad range of technologies.

This experience provides the company with a **high capacity of design and hybridization** among power generation technologies, that allows it to offer the optimal solution to its clients.



Decarbonization Solutions  
Hybrid and Captive Power

[www.abengoa.com/energy](http://www.abengoa.com/energy)

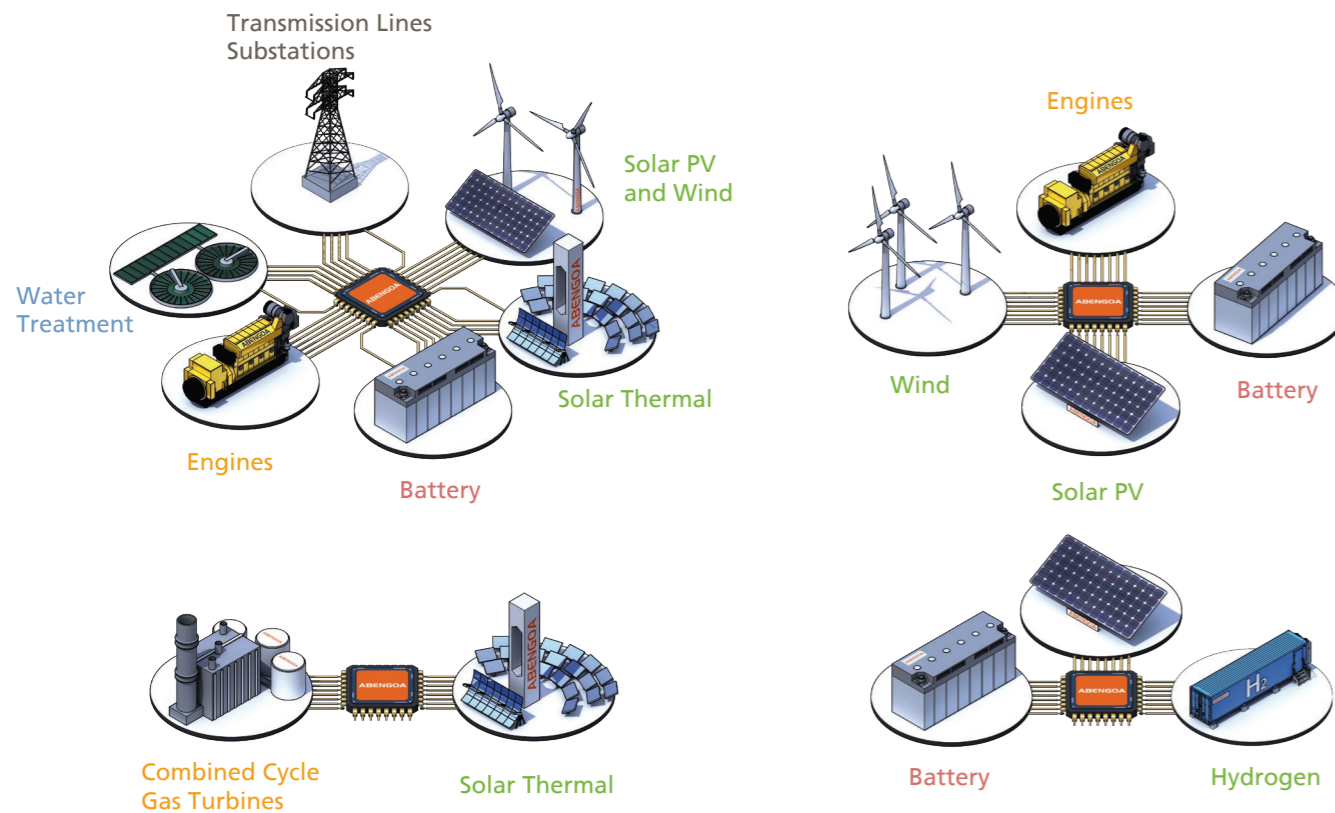
**ABENGOA**

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## Tecnology

<b>500 MW</b> Solar PV	<b>5 plants</b> Hydrogen	<b>580 MW</b> Engines	<b>1,100 Km</b> Hydraulic Infraestructures
<b>1,900 MW</b> Solar Thermal	<b>14 MW</b> Battery Energy Storage	<b>5,000 MW</b> Combined Cycle Gas Turbines	<b>3.8 M m<sup>3</sup>/d</b> Water and Wastewater Treatment
<b>480 MW</b> Wind Power	<b>6,000 MWh<sub>th</sub></b> Thermal Energy Storage	<b>27,000 Km</b> Transmission Lines	<b>1.8 M m<sup>3</sup>/d</b> Desalination
<b>400 MW</b> Hydropower	<b>1,400 MW</b> Biomass/Cogen	<b>330 units</b> Substations	<b>650,000 m<sup>3</sup>/d</b> Industrial Wastewater Treatment and Reuse

## Integration capabilities and hybrid systems



# ABENGOA Energy

